(Adopted March 2, 1979)(Amended June 1, 1979)(Amended February 1, 1980)
(Amended July 8, 1983)(Amended May 5, 1989)(Amended April 5, 1991)
(Amended July 11, 1997)

RULE 1122. SOLVENT DEGREASERS

(a) Applicability

This rule applies to all persons who own or operate , batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing Volatile Organic Compounds (VOCs). Solvent degreasing operations that are regulated by this rule include, but are not limited to, the removal of contaminants from parts, products, tools, machinery, and equipment.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AIR-SOLVENT INTERFACE is the point of contact between the exposed solvent and air.

(2) AIR-VAPOR INTERFACE is the point of contact between the exposed solvent vapor and air.

(3) AIR-VAPOR INTERFACE SURFACE AREA

(A) Means the geometric surface area of the open-top of the degreaser for OPEN-TOP VAPOR DEGREASERS; or

(B) Means the combined geometric surface areas of the projected plane surfaces of all degreaser openings for CONVEYORIZED DEGREASERS.

(4) AIR-SOLVENT INTERFACE SURFACE AREA means the combined geometric surface areas of the projected plane surfaces of all degreaser openings for CONVEYORIZED DEGREASERS.

(5) AIRLESS CLEANING SYSTEM is a degreasing machine that is automatically operated and seals at a differential pressure of 25 torr or less, prior to the introduction of solvent vapor into the cleaning chamber and maintains differential pressure under vacuum during all cleaning and drying cycles.

(6) AIR-TIGHT CLEANING SYSTEM is a degreasing machine that is automatically operated and seals at a differential pressure no greater than 0.5 psig during all cleaning and drying cycles.

(7) AUTOMATED PARTS HANDLING SYSTEM, such as a hoist or a conveyor, is a mechanical device that carries all parts and parts baskets, at a controlled speed, from the initial loading of soiled or wet parts through the removal of the cleaned or dried parts.

(8) BATCH-LOADED COLD CLEANER is a batch-operated degreaser that is designed to contain liquid solvent, has an air-solvent interface, and is always operated at a temperature below the solvent's boiling point.

(9) CLEAN AIR SOLVENT is as defined in Rule 102.

(10) CLEAN AIR SOLVENT CERTIFICATE is a certificate issued by the District to a manufacturer**,** distributor, or facility for a specified product or class of products that meets the criteria for a Clean Air Solvent.

(11) CIRCUMFERENTIAL TROUGH is a receptacle located below the primary condenser that conveys condensed solvent and atmospheric moisture to a water separator.

(12) CONDENSER WATER FLOW SWITCH is a safety switch that turns off the sump heat if condenser water fails to circulate or rises above the design operating temperature.

(13) CONVEYORIZED DEGREASER is any degreaser which uses an integral, continuous, mechanical system for moving materials or parts to be cleaned into and out of a solvent liquid or vapor cleaning zone.

(14) DRAG-OUT is that solvent carried out of a degreaser that adheres to or is entrapped in the part being removed.

(15) DEGREASER is any equipment designed and used for holding a solvent to carry out solvent cleaning operations, including but not limited to batch-loaded cold cleaners, open-top vapor degreasers, conveyorized (in-line) degreasers, and air-tight and airless cleaning systems.

(16) DRYING TUNNEL is an add-on enclosure extending from the exit area of a conveyorized degreaser which reduces drag-out losses by containing evaporating solvent.

(17) EXEMPT COMPOUNDS are as defined in Rule 102.

(18) FREEBOARD AREA is the air space in a batch-loaded cold cleaner that extends from the liquid surface to the top of the tank.

(19) FREEBOARD HEIGHT

(A) Is the distance from the top of the solvent to the top of the tank for BATCH-LOADED COLD CLEANERS; or

(B) Is the distance from the air-vapor interface to the top of the tank for OPEN-TOP VAPOR DEGREASERS; or

(C) Is the distance from either the air-solvent or air-vapor interface to the top of the tank for conveyorized degreasers.

(20) FREEBOARD RATIO is the freeboard height divided by the smaller of either the inside length or inside width of the degreaser.

(21) LIQUID LEAK is a VOC-containing liquid leak from the degreaser at a rate of three drops per minute or more or any visible liquid mist.

(22) OPEN-TOP VAPOR DEGREASER is any batch-loaded, boiling solvent degreaser.

(23) PERSON is any firm, business establishment, association, partnership, corporation or individual, whether acting as principal, agent, employee, or other capacity, including any governmental entity or charitable organization.

(24) PRIMARY CONDENSER means a series of circumferential cooling coils on the inside walls of a vapor degreaser through which a chilled substance is circulated or recirculated to provide continuous condensation of rinsing solvent vapors, thereby creating a concentrated solvent vapor zone.

(25) REFRIGERATED FREEBOARD CHILLER is an emission control device which is mounted above the water jacket or primary condenser coils, consisting of secondary coils which carry a refrigerant to provide a chilled air blanket above the solvent vapor to reduce emissions from the degreaser bath.

(26) ROTATING BASKET is a perforated or wire mesh cylinder containing parts to be cleaned that is slowly rotated while proceeding through the degreaser.

(27) SOLVENT DEGREASING is any portion of the operation from the removal of contaminants with solvents, from parts, products, tools, machinery, and equipment to the subsequent drying of the items.

(28) SOLVENT CONTAINER is that part of the degreaser that is intended to hold the cleaning solvent.

(29) SPRAY PUMP CONTROL SWITCH is a safety switch that prevents the spray pump from operating without an adequate vapor level.

(30) SUPERHEATED VAPOR ZONE is a region located within the vapor zone of a degreaser whereby solvent vapors are heated above the solvent's boiling point.

(31) VAPOR LEVEL CONTROL SWITCH is a safety switch that turns off the sump heat when the solvent vapor level rises above the design operating level.

(32) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.

(33) WORKLOAD AREA means:

(A) the plane geometric surface area of the top of the submerged parts basket, or

(B) the combined plane geometric surface area(s) displaced by the submerged part(s), if no parts basket is used.

(c) Work Practice Requirements

Any person owning or operating a batch-loaded cold cleaner, an open-top vapor degreaser, or any type of conveyorized degreaser with a VOC-containing solvent shall meet the following work practice requirements:

(1) Batch-Loaded Cold Cleaners

(A) The degreaser shall be operated in accordance with the manufacturer's specifications and be used with tightly fitting covers that are free of cracks, holes or other defects. In addition, the cover shall be closed at all times when the degreaser contains solvent, except during parts entry and removal or performing maintenance or monitoring that requires the removal of the cover.

(B) The parts to be cleaned shall be racked in a manner that will minimize the drag-out losses.

(C) Parts shall be drained immediately after the cleaning, until

(i) At least 15 seconds have elapsed; or

(ii) Dripping of solvent ceases; or

(iii) The parts become visibly dry.

Parts with blind holes or cavities shall be tipped or rotated before being removed from a degreaser such that the solvents in the blind holes or cavities are drained in accordance with the above requirements.

(D) The solvent container shall be free of all liquid leaks. Auxiliary degreaser equipment, such as pumps, water separators, steam traps,

or distillation units shall not have any liquid leaks, visible tears, or cracks. In addition, any liquid leak, visible tear, or crack detected pursuant to the provisions of this subparagraph shall be repaired within 48 hours, or the degreaser shall be drained of all solvent and shut down until replaced or repaired.

(E) Draining or filling of solvent containers shall be performed beneath the liquid solvent surface.

(F) All waste solvents shall be stored in properly identified and sealed containers. All associated pressure relief devices shall not allow liquid solvents to drain out.

(G) Solvent flow cleaning shall be done within the freeboard area, and shall be done by a liquid stream rather than a fine, atomized, or shower-type spray. Solvent flow shall be directed downward to avoid turbulence at the air-solvent interface and to prevent liquid solvent from splashing outside of the degreaser.

(H) Degreasing of porous or absorbent materials, such as cloth, leather, wood, or rope, is prohibited.

(I) Solvent agitation, where necessary, shall be carried out only by pump recirculation, ultrasonics, a mixer, or by air agitation. Air agitation shall be accomplished under the following conditions:

(i) The air agitation unit shall be equipped with a gauge and a device that limits air pressure into the degreaser to less than two pounds per square inch gauge;

(ii) The cover must remain closed while the air agitation system is in operation; and

(iii) Pump circulation shall be performed without causing splashing.

(J) The average draft rate in the work room, as measured parallel to the plane of the degreaser opening, shall not exceed 9.1 meters per minute (30 feet per minute).

(K) Ventilation fans shall not be positioned in such a way as to direct air flow near the degreaser openings.

(L) Spills during solvent transfer shall be wiped up immediately and the used wipe rags shall be stored in closed containers that are handled in accordance with subparagraph (c)(1)(F).

(M) Solvent levels shall not exceed the fill line.

(2) Open-Top Vapor and All Conveyorized Degreasers.

(A) The degreaser shall be operated in accordance with the manufacturer's specifications and be used with a tightly-fitting cover that is free of cracks, holes or other defects, except as provided in paragraph (f)(3). In addition, the cover shall be closed during idling and downtime modes, except while performing maintenance or monitoring that requires the removal of the cover.

(B) The solvent container shall be free of all liquid leaks. Auxiliary degreaser equipment, such as pumps, water separators, steam traps, or distillation units shall not have any liquid leaks, visible tears, or cracks. In addition, any liquid leak, visible tear, or crack detected pursuant to the provisions of this subparagraph shall be repaired within 48 hours, or the degreaser shall be drained of all solvents and shut down until replaced or repaired.

(C) Degreasing of porous or absorbent materials, such as cloth, leather, wood, or rope, is prohibited.

(D) Transfer of solvent into or out of solvent containers shall be performed with leak-proof couplings and the end of the pipe in the solvent sump shall be located beneath the liquid solvent surface.

(E) The vertical speed of the powered hoist or conveyor, shall not be more than 3.4 meters per minute (11.2 feet per minute) when lowering and raising parts in and out of the degreaser, respectively.

(F) The average draft rate in the work room, as measured parallel to the plane of the degreaser opening, shall not exceed 9.1 meters per minute (30) feet per minute.

(G) At start up, the primary condenser and the refrigerated freeboard chiller, if one is required, shall be turned on before the sump heater is turned on. At shutdown, the sump heater shall be turned off before the primary condenser and refrigerated freeboard chiller are turned off.

(H) The water separator shall be maintained to prevent water from returning to the surface of the boiling solvent sump or from becoming visibly detectable in the solvent exiting the water separator.

(I) The workload area shall not exceed more than half of the degreaser's air-vapor interface surface area.

(J) The workload shall be degreased in the vapor zone until condensation ceases.

(K) The temperature within the superheated vapor zone shall be at least 10°F above the boiling point of the solvent being used.

(L) Parts and parts baskets shall remain in the superheated vapor zone for at least the minimum proper dwell time, as stated in the manufacturer's specification.

(M) Solvent flow cleaning shall be done within the vapor zone and shall be done by a liquid stream rather than a fine, atomized, or shower-type spray. Solvent flow shall be directed downward to avoid turbulence at the air-vapor interface and to prevent liquid solvent from splashing out of the degreaser.

(N) Ventilation fans shall not be positioned in such a way as to direct air flow near the degreaser openings.

(O) All waste solvents shall be stored in properly identified and sealed containers. All associated pressure relief devices shall not allow liquid solvents to drain out.

(P) Spills during solvent transfer shall be wiped up immediately and the used wipe rags shall be stored in closed containers that are handled in accordance with subparagraph (c)(2)(O).

(Q) Solvent levels shall not exceed the fill line.

(d) Design Requirements and Control Standards for Batch-Loaded Cold Cleaners

In addition to the requirements of paragraph (c)(1), any person owning or operating a batch-loaded cold cleaner shall also meet all of the following requirements:

(1) The applicable requirements of subdivision (d) and paragraph (c)(1) shall be legibly written, and permanently and conspicuously posted on or near the degreaser in such a manner that it is conveniently available to the operator for reference purposes.

(2) Prior to January 1, 1999, a batch-loaded cold cleaner using a solvent containing more than 50 g/l of VOC shall be fitted with a drainage facility inside the degreaser and have :

(A) a water cover over the surface of the solvent if the solvent has a negligible solubility in water and has a density greater than that of water; or

(B) a freeboard ratio of at least 0.75.

(3) Effective January 1, 1999, cleaning materials shall:

(A) have a VOC content of 50 g/l or less, as used ; or

(B) be used in an air-tight or airless cleaning system that complies with the requirements of subdivision (g).

(4) A device for draining cleaned parts shall be used such that drained or drag-out solvent is returned.

(e) Design Requirements and Control Standards for Open-Top Vapor Degreasers

In addition to the applicable requirements of paragraph (c)(2), any person owning or operating an open-top vapor degreaser shall also meet all of the following requirements:

(1) The applicable requirements of paragraph (c)(2) shall be legibly written, and permanently and conspicuously posted on or near the degreaser in such a manner that it is conveniently available to the operator for reference purposes;

(2) The following safety switches shall be installed:

(A) Vapor level control switch;

(B) Condenser water flow switch, for water-cooled degreasers;

(C) Spray pump control switch, for solvent flow cleaning; and

(D) Sump heat shut-off process control switch or a float for low liquid level indication.

(3) Prior to January 1, 1999, the freeboard ratio shall be :

(A) at least 0.75, for degreasers with an inside length or width equal to or greater than 10 feet, and

(B) at least 1.0, for all other open-top vapor degreasers.

(4) Prior to January 1, 1999, open-top vapor degreasers which have air-vapor interface surface areas of more than 1.0 square meters (10.8 square feet) shall be equipped with:

(A) A refrigerated freeboard chiller, designed such that the refrigerant temperature at the degreaser outlet does not exceed 4.4^{o}C (40^{o}F), or

(B) An enclosed batch-type design, with a programmable hoist, and a freeboard ratio of at least 1.0.

(5) Prior to January 1, 1999, in addition to the requirements in paragraph (e)(4) above, an open-top vapor degreaser which has an air-vapor interface

surface area of more than 2.0 square meters (21.5 square feet) shall have automated, powered, or mechanically-assisted covers that slide off the degreaser in a horizontal motion.

(6) Effective January 1, 1999, all open-top vapor degreasers shall be equipped with:

(A) an automated parts handling system;

(B) circumferential primary condensing coils;

(C) a circumferential trough;

(D) a water separator;

(E) a freeboard ratio of at least 1.0, and

(F) a superheated vapor zone.

In lieu of the superheated vapor zone, a refrigerated freeboard chiller may be used if the chilled air blanket temperature, measured at the center of the air blanket, is no greater than 40% of the boiling point of the solvent, in degrees Fahrenheit, for solvents that do not form azeotropes with water, or 50% of the boiling point, in degrees Fahrenheit, for solvents that form azeotropes with water. A water separator is not required for solvents that form azeotropes with water.

(f) Conveyorized Degreasers

In addition to the requirements of paragraph (c)(2), any person owning or operating a conveyorized degreaser shall meet all of the following requirements:

(1) The applicable operating requirements of subdivision (f) and paragraph (c)(2) shall be legibly written, and permanently and conspicuously posted on or near the degreaser in such a manner that it is conveniently available to the operator for reference purposes;

(2) A high vapor cutoff thermostat with manual reset shall be installed;

(3) Entrances and exits shall have an average clearance between each part and the edge of the degreaser opening of less than 10 centimeters (3.9 inches) or less than 10 percent of the width of the opening, whichever is less.

(4) Prior to January 1, 1999, a conveyorized degreaser:

(A) Shall have a freeboard ratio of at least 0.75;

(B) Shall have a drying tunnel that is connected to the main control enclosure, or use of other means such as a rotating or tumbling basket, that reduces drag-out losses;

(C) With air-vapor or air-solvent interface surface areas of more than 1.0 square meter (10.8 square feet), but less than or equal to 2.0 square meters (21.6 square feet), shall have a freeboard chiller, designed such that the refrigerant temperature at the degreaser outlet does not exceed 4.4°C (40°F).

(D) With air-vapor or air-solvent interface surface areas of more than 2.0 square meters (21.6 square feet) shall have a below-freezing refrigerated freeboard chiller, designed such that the refrigerant temperature at the degreaser outlet does not exceed -20°C (-4°F).

(5) Effective January 1,1999, conveyorized vapor degreasers shall be equipped with:

(A) an automated parts handling system;

(B) circumferential primary condensing coils;

(C) a circumferential trough;

(D) a water separator;

(E) a freeboard ratio of at least 1.0;

(F) a refrigerated freeboard chiller that is operated such that the chilled air blanket temperature measured at the center of the air blanket is no greater than 40% of the boiling point of the solvent, in degrees Fahrenheit, for solvents that do not form azeotropes with water, or 50% of the boiling point, in degrees Fahrenheit, for solvents that form azeotropes with water. A water separator is not required for solvents that form azeotropes with water, and;

(G) a superheated vapor zone.

(6) Effective January 1, 1999, conveyorized cold cleaners shall use cleaning materials that have a VOC content of 50 g/l or less, as used.

(g) Air-tight or Airless Cleaning System Requirements

In lieu of meeting the requirements of subdivisions (d) or (e), any person may use an air-tight or airless batch cleaning system provided all of the following requirements are met:

(1) The equipment is operated in accordance with the manufacturer's specifications and operated with a door or other pressure sealing apparatus that is in place during all cleaning and drying cycles.

(2) All waste solvents are stored in properly identified and sealed containers. All associated pressure relief devices shall not allow liquid solvents to drain out.

(3) Spills during solvent transfer shall be wiped up immediately and the used wipe rags shall be stored in closed containers that are handled in accordance with paragraph (g)(2).

(4) A differential pressure gauge shall be installed to indicate the sealed chamber pressure.

(h) Clean Air Solvent Certificate

A manufacturer, distributor, or facility may apply for a Clean Air Solvent Certificate for a specified product or class of products that meets the requirements for a Clean Air Solvent.

(1) The application shall contain all relevant information to support the technical basis for designation as a Clean Air Solvent.

(2) The Executive Officer will issue a certificate for a Clean Air Solvent if it is determined that the specific product or class of products meets the requirements of a Clean Air Solvent.

A Clean Air Solvent Certificate shall be valid for five years from the date of issuance, provided the solvent continues to meet the conditions of certification, and shall be renewed upon the Executive Officer's determination that the product(s) continues to meet the criteria for a Clean Air Solvent.

(i) Compliance Test Methods

(1) The VOC content of materials subject to the provisions of this rule shall be determined by the EPA Reference Method 24 (Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A), or by SCAQMD Method 304 [Determination of Volatile Organic Compounds (VOCs) in Various Materials] contained in the SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual. The VOC content of materials containing 50 g/l of VOC or less shall be determined by SCAQMD Method 313 (Determination of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry).

(2) The initial boiling point of solvents shall be determined by ASTM Method D-1078-78, "Standard Test Method for Distillation Range of Volatile Organic Liquids."

(3) Measurements of average workroom draft rate shall be done parallel to the plane of the degreaser opening with a thermistor anemometer with an accuracy within ±2 feet per minute and a calibration traceable to the National Institute of Standards and Technology.

(j) Monitoring, Recordkeeping, and Reporting

Prior to January 1, 1999, records shall be maintained pursuant to Rule 109 for all applications subject to this rule. Effective January 1, 1999, a person who owns or operates any degreaser subject to this rule shall record at monthly intervals the following information in a format which will provide all the data shown in Attachment A:

(1) the weight, in pounds, of VOCs added to the degreaser in the calendar month (W_a);

(2) the weight, in pounds, of VOCs removed from the degreaser in the calendar month (W_b);

(3) the weight, in pounds, of VOCs contained in the solid waste removed from the degreaser in the calendar month (W_c); and

(4) the monthly emissions (E) determined by the following equation:

$$E = W_a - W_b - W_c .$$

In lieu of test data, the VOCs contained in the solid waste (W_c) may be calculated as 50% of the weight (in pounds) of the solid waste material removed from the degreasers.

The monthly record shall also include:

(A) the SCAQMD permit number, or serial/identification number for the degreaser;

(B) the product name of the cleaning material;

(C) the VOC content of the cleaning material; and

(D) the boiling point of the cleaning material.

Records shall be retained for a period of at least two years, and be made available to the Executive Officer upon request.

(k) Exemptions

(1) The provisions of this rule shall not apply to:

(A) Degreasers using only Clean Air Solvents in accordance with the conditions specified in a valid Clean Air Certificate, a copy of which shall be kept at the site of operation.

(B) Degreasers using only cleaning materials that contain 50 g/l of VOC or less, as used where the VOC content is determined according to test methods specified in subdivision (i).

(C) Unheated, batch-loaded cold cleaners and vapor degreasers, until January 1, 2003, with open-top surface areas less than 1.0 square foot (0.1 square meter), or with a capacity of less than 2 gallons, provided:

(i) the equipment is used only for electrical, high precision optics or electronics applications; or aerospace and military applications for cleaning solar cells, laser hardware, space vehicle components, fluid systems, and components used solely in research and development programs, or laboratory tests in quality assurance laboratories;

(ii) solvent usage is less than five (5.0) gallons per calendar month;

(iii) the equipment is operated in compliance with the applicable work practice requirements of paragraphs (c)(1) or (c)(2), except for subparagraphs (c)(1)(E) and (J) or (c)(2)(F); and

(iv) the operator meets the requirements for Monitoring, Recordkeeping, and Reporting of subdivision (j).

(D) Degreasers using halogenated solvents, provided such application is subject to the federal NESHAP for halogenated solvent cleaners, 40 CFR Part 63.

(l) Technology Assessment

By the year 2002, the District will perform a Technology Assessment to determine whether it is necessary to continue the exemptions listed under subparagraph (k)(1)(C).

ATTACHMENT A

RECORDKEEPING FORMS

Form A: Equipment and Material Information

AQMD Permit No. If Applicable	**Identification No.**	**Name of Degreasing Material**
Manufacturer of Material	**Supplier of Material**	**VOC Content of Material (gm/l or lb/gal)**
VOC of Concentrate (g/l or lb/gal)	**Diluted (As Used) VOC Content (gm/l or lb/gal)**	**Boiling Point of the Material if Used in a Vapor Degreaser (degrees F or degrees C)**

Form B: Monthly Emissions Determination

Year	Name of Degreasing or Drying Solvent	W_a (lbs)	W_b (lbs)	W_c (lbs)	Monthly Emissions $\underline{(W_a - W_b - W_c)}$
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

$\underline{(W_a)}$ = Weight in pounds, of the VOCs added during any one calendar-month

$\underline{(W_b)}$ = Weight in pounds, of the VOCs removed from the degreaser or drying device, during the calendar-month

$\underline{(W_c)}$ = Weight in pounds, of the VOCs in the solid waste removed from the degreaser or drying device, during the calendar-month

(W_a), (W_b) = (Volume Used) x (VOC content, as Used)

$\underline{(W_c)}$ = Provided by hazardous waste hauler as the difference between the total weight of hazardous waste and the weight of the soil content or may be calculated as50% of the weight (in pounds) of the solid waste removed from the degreaser.